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Research Article

Dermatological Disease Patterns by Age and Sex: A Two-Year Analytical Study in an Urban Private Practice, Jakarta (2024–2025)

Medina Aulia Rahmi[1]*, Windy Keumala Budianti[2]

[1] Tambak Women and Children's Hospital, Central Jakarta, Indonesia
[2] Department of Dermatology and Venereology, Faculty of Medicine, Universitas Indonesia
* Corresponding Author: medina.rahmi@gmail.com

Abstract: Skin diseases remain a major burden in outpatient dermatology services in Indonesia, with diagnostic patterns differing across age groups and sex due to variations in hormonal status, environmental exposure, and immune function. This study aimed to analyze the distribution of dermatological diagnoses by age and sex among patients attending a private health and beauty clinic in Menteng, Central Jakarta, between January 2024 and December 2025. A cross-sectional analytic observational design was conducted using secondary data from 8,105 patient visits, with diagnoses classified according to ICD-10 and grouped into eight age categories. Data were analyzed using the Chi-square goodness-of-fit test. The findings revealed that female patients accounted for 74.9% of all visits (χ^2 = 2,016.761; $p < 0.001$). The three most frequent diagnoses were acne vulgaris (15.2%), atopic dermatitis (9.3%), and chloasma (9.1%). Acne vulgaris and chloasma were predominantly observed in adults, while atopic dermatitis also occurred most frequently in the adult age group. All ten leading diagnoses demonstrated statistically significant differences in age distribution ($p < 0.001$). These findings highlight the importance of age- and sex-specific approaches to prevention, early detection, and resource allocation in urban private dermatology practice.

Keywords: Age Groups; Cross-Sectional Studies; Dermatology; Sex Distribution; Skin Disease; Urban Health.

1. Introduction

Skin and subcutaneous tissue disorders constitute one of the most frequently encountered categories of illness in primary and outpatient care settings

across Southeast Asia, including Indonesia (Hay et al., 2014). Urban populations, in particular, face an elevated risk of dermatological conditions due to a combination of factors including high-density living, pollution, heat and humidity, dietary patterns, and the growing use of cosmeceuticals **(Surber & Kottner, 2017)**. Jakarta, as the largest metropolitan area in Indonesia, exhibits a unique epidemiological profile of skin diseases that reflects both the general burden of tropical infections and the emerging predominance of non-communicable dermatological conditions linked to cosmetic concerns, psychological stress, and immune dysregulation (Djuanda et al., 2017).

Globally, the Global Burden of Disease study has identified dermatological conditions among the leading causes of non-fatal disease burden, with conditions such as acne vulgaris, atopic dermatitis, and psoriasis collectively affecting hundreds of millions of people (Lim et al., 2017; Vos et al., 2016). In Indonesia, studies from public hospital outpatient dermatology departments have documented consistent dominance of inflammatory dermatoses, infectious disease

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such as scabies, leprosy, and fungal infections (Trisnaini et al., 2025). However, data from private beauty and dermatology clinics in Jakarta which serve a distinct patient demographic are limited.

Understanding the distribution of diagnoses across age groups is fundamental to designing targeted clinical protocols, allocating human and material resources appropriately, and developing prevention programs tailored to population-specific risk factors (Smidt et al., 2010). The study clinic, located in the Menteng sub-district of Central Jakarta, is a private outpatient dermatology and venereology facility serving a diverse urban population ranging from pediatric to geriatric patients.

Cross-sectional studies using secondary outpatient data offer a rapid and resource-efficient method for characterizing disease burden and identifying patterns of care. When combined with analytical statistical methods such as chi-square testing, they can reveal whether observed differences in diagnosis rates across subgroups are statistically significant, guiding evidence-based clinical and public health decisions (Kelsey et al., 1986). This study aims to bridge a gap in the local literature by providing a comprehensive two-year analytical overview of the dermatological case mix at the private health and beauty clinic, with particular focus on age and sex-stratified patterns among the leading diagnoses.

2. Objective

The primary aim of this study was to evaluate the distribution of dermatological diagnoses across age groups and sexes among outpatients attending a private health and beauty clinic in Menteng, Central Jakarta, from January 2024 to December 2025. In addition, the study sought to identify the ten most prevalent dermatological diagnoses within the clinical population and to determine whether diagnosis type was significantly associated with sex and age group using chi-square tests of association and goodness-of-fit.

3. Methods

Study Design and Setting

This study employed a cross-sectional, descriptive-analytic observational design using retrospective secondary data collected from outpatient visit records. The research was conducted at a private health and beauty clinic located in Menteng subdistrict of Central Jakarta, Indonesia. The temporal observation window spanned two complete calendar years, spanning from January 1, 2024 to December 31, 2025, to account for potential longitudinal variations and seasonal fluctuations in outpatient presentations.

Data Source and Inclusion Criteria

The primary data were extracted from the health and beauty clinic's electronic medical record (EMR) database, then exported into a structured database using Microsoft Excel format. The study population comprised all consecutive outpatient encounters registered during the two-year study period.

Inclusion Criteria

All patient visit records with a documented, valid primary dermatological diagnosis coded according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), along with complete demographic information regarding patient age and biological sex.

Excusion criteria

Visit records missing a primary ICD-10 diagnostic entry, records with ambiguous or incomplete age or sex data, and non-dermatological administrative visits..

Each visit was treated as an independent observation. Following systematic screening, a final analytical sample of n = 8,105 eligible patient visit records was included, encompassing 126 distinct primary ICD-10 diagnostic codes.

The primary dependent variable was the ICD-10 diagnosis code, operationalized via specific ICD-10 codes assigned by board-certified dermatologists during consultations. The independent variables included:

Sex: Categorized as binary data (male vs. female) and Age Stratification: To enable developmental analysis while maintaining statistical power, the raw clinical dataset which initially contained 21 age brackets ranging from neonates (29 hours–3 months) to advanced geriatric cohorts (≥85 years) was consolidated into eight standardized developmental strata based on World Health Organization (WHO) frameworks and clinical relevance, consisting of Infants (<1 year), Young Children (1-4 years), Older Children (5-9 years), Young Adolescent (10-14 years), Older Adolescents (15-19 years), Young Adults (20-24 years), Adults (25–59 years), and Elderly (≥60 years).

Statistical Analysis

Descriptive statistics were computed for all variables, including absolute frequencies and proportions. The chi-square (X^2) goodness-of-fit test was used to determine whether the observed age-group distribution for each top-10 diagnosis differed significantly from a uniform distribution across the eight age strata. An independent chi-square test of association was used to evaluate sex differences within diagnoses, using a 2 × 2 contingency table (male vs. female). A global chi-square test of independence was performed on the 10 × 8 cross-tabulation matrix of top-10 diagnoses by broad age group. Statistical significance was defined as $p < 0.05$. All analyses were performed using SPSS 26.0.

4. Results

Patient Characteristics

During the study period, 8,105 patient visits with valid diagnoses were recorded. The mean annual visit volume was approximately 4,052 visits per year. Female patients constituted the majority of the clinical population (n = 6,074; 74.9%), compared to male patients (n = 2,031; 25.1%). This sex difference was statistically highly significant ($X^2 = 2{,}016.761$, $p < 0.001$). Table 1 presents the demographic profile of the study population.

Table 1. Sex Distribution of Patients at the Clinic (January 2024–December 2025)

Gender	n	%	p-value
Male	2,031	25.1%	
Female	6,074	74.9%	<0.001***
Total	**8,105**	**100%**	

*Note: *** p < 0.001. Chi-square test of association.*

In terms of age distribution, the Adults group (25–59 years) accounted for the largest proportion of visits (n = 5,118; 63.1%), followed by the Young Adults group (20-24 years; n = 718; 8.9%). The Young Adolescent group (10–14 years) contributed 561 visits (6.9%), while Elderly patients (≥60 years) constituted only 4.7% (n = 380) of the total caseload.

Table 2. Age Group Profile of Patients at the Clinic (January 2024–December 2025)

Age Group	**n**	**%**	**p-value**
Infants (<1 years)	116	1.4%	
Young Children (1-4 years)	363	4.5%	
Older Children (5-9 years)	401	4.9%	
Young Adolescent (10-14 years)	561	6.9%	
Older Adolescents (15-19 years)	448	5.5%	<0.001***
Young Adults (20-24 years)	718	8.9%	
Adults (25–59 years)	5118	63.1%	
Elderly (≥60 years)	380	4.7%	
Total	**8,10**	**100%**	

*Note: *** p < 0.001. Chi-square goodness-of-fit.*

Prevalence of Top 10 Diagnoses

A total of 126 distinct ICD-10 diagnoses were recorded during the study period. The ten most frequent diagnoses are presented in Table 3. Acne vulgaris was the most common diagnosis (n = 1,230; 15.2%), followed by atopic dermatitis (n = 756; 9.3%), and chloasma (n = 740; 9.1%). Together, these three diagnoses accounted for 33.6% of all visits. The top 10 diagnoses combined accounted for 58.0% of total visit volume.

Marked sex disparities were observed across all top-10 diagnoses. Chloasma demonstrated the highest female predominance (95% female), followed by acne vulgaris (85.3% female), and disorder of pigmentation (82.4% female). Vitiligo showed the most balanced sex distribution among the top diagnoses (39.5% male, 60.5% female). Chi-square tests for sex distribution were statistically significant for all 10 diagnoses (all $p < 0.001$), as detailed in Table 3.

Table 3. Top 10 Dermatological Diagnoses and Sex Distribution (January 2024–December 2025)

No	Diagnosis	n	%	Male n (%)	Female n (%)	x^2	p-value
1	Acne Vulgaris	1,230	15.2%	181 (14.7%)	1,049 (85.3%)	612.540	<0.001***
2	Atopic Dermatitis	756	9.3%	269 (35.6%)	487 (64.4%)	62.862	
3	Chloasma	740	9.1%	37(5.0%)	703 (95.0%)	599.400	
4	Allergic Contact Dermatitis	382	4.7%	70 (18.3%)	312 (81.7%)	153.309	
5	Psoriasis Vulgaris	341	4.2%	106 (31.1%)	235 (68.9%)	48.801	
6	Scar Conditions and Fibrosis of Skin	312	3.8%	86 (27.6%)	226 (72.4%)	62.821	
7	Vitiligo	306	3.8%	121 (39.5%)	185 (60.5%)	13.386	
8	Irritant Contact Dermatitis	287	3.5%	58 (20.2%)	229 (79.8%)	102.885	
9	Disorder of Pigmentation	182	2.2%	32 (17.6%)	150 (82.4%)	76.505	
10	Seborrhoeic Keratosis	165	2.0%	33 (20%)	132 (80%)	59.400	

*Note: χ^2 = chi-square statistic for sex distribution (male vs female). *** $p < 0.001$. n = absolute frequency; % = proportion of total visits.*

Age Group Distribution by Diagnosis

Table 4 presents the distribution of the ten most frequent diagnoses across the eight broad age groups, along with chi-square statistics testing uniformity of age distribution. All 10 diagnoses showed statistically significant non-uniform distribution across age groups (all $\chi^2 > 100$, $p < 0.001$), confirming that each disease has a distinctive age profile.

Acne vulgaris peaked markedly in the Adults group (n = 803; 65.2% of all acne vulgaris cases), with a secondary peak in the young Adults group (n = 227; 18.4%). Atopic dermatitis showed its highest burden in the Adults group (n = 264; 34.9%). Even though its classic onset occurs in early childhood, young children accounted for the second-highest burden of atopic dermatitis (n = 121; 16.0%). Chloasma was predominantly in Adults (n = 644; 87%), consistent with its association with hormonal changes and cumulative UV exposure. Vitiligo peaked in the Young Adolescents (n = 107; 34.9%) and Adults (n = 102; 33.3%). Seborrhoeic keratosis, a benign epidermal lesion, predictably showed a high predominance in mature age group, peaking in the Adults group (n = 139; 84.2%).

Table 4. Distribution of Top 10 Diagnoses Across Broad Age Groups with Chi-Square Test Results

Diagnosis	Infants (<1 yr)	Young Children (1-4 yrs)	Older Children (5-9 yrs)	Young Adolescents (10-14 yrs)	Older Adolescents (15-19 yrs)	Young Adults (20–24 yrs)	Adults (25–59 yrs)	Elderly (≥60 yrs)	Total	χ^2	p-value
Acne vulgaris	0	1	1	53	142	227	803	3	1,230	2,863.70	<0.001***
Atopic dermatitis	54	121	106	112	40	37	264	22	756	455.49	<0.001***
Chloasma	0	1	3	7	8	17	644	60	740	3,221.10	<0.001***
Allergic contact dermatitis	2	9	35	31	13	33	249	10	382	922.45	<0.001***
Psoriasis vulgaris	0	2	15	23	11	35	244	11	341	926.82	<0.001***
Scar/fibrosis of skin	2	0	1	9	23	63	213	1	312	808.76	<0.001***
Vitiligo	1	13	34	107	25	18	102	6	306	325.73	<0.001***
Irritant contact dermatitis	9	15	14	11	7	16	200	15	287	860.12	<0.001***
Disorder of Pigmentation	2	6	10	8	8	21	123	4	182	514.87	<0.001***
Seborrhoeic keratosis	0	0	0	0	4	9	139	13	165	309.84	<0.001***

*Note: χ^2 = chi-square goodness-of-fit statistic (observed vs. uniform distribution across 8 age groups, df = 7). *** $p < 0.001$. Bottom row: global chi-square of independence for 10×8 matrix (df = 63, χ^2 = 19,211.766, $p < 0.001$).*

5. Discussion

This two-year cross-sectional study conducted at a private health and beauty clinic in Central Jakarta provides a detailed analytical portrait of dermatological morbidity and outpatient care utilization in an urban private practice setting. By comprehensively evaluating a large volume of patient visits (n = 8,105) over a two-calendar-year observation period (January 2024 to December 2025), the findings reveal clear and statistically significant patterns of diagnostic distribution stratified by both age group and sex. These empirical insights carry critical implications for clinical decision-making, patient-centered communication, public health strategies, and operational resource planning in private ambulatory dermatology within tropical, rapidly urbanizing Asian environments.

The marked female predominance observed in this study (74.9% female vs. 25.1% male; χ^2 = 2,016.761, $p < 0.001$) aligns closely with epidemiological patterns reported across outpatient dermatology and venereology departments in regional and academic hospitals in Indonesia (Alfadli & Khairunisa, 2024). This disparity reflects well-documented differences in health-seeking behaviors between sexes, wherein women exhibit a significantly higher inclination to seek professional medical advice for early-stage or non-life-threatening cutaneous conditions. Furthermore, heightened cosmetic awareness, social standards of personal appearance, and a lower

threshold for presenting with aesthetic concerns heavily influence visit rates in private urban clinics.

From a physiological perspective, this gender imbalance is driven by the burden of hormonally influenced conditions such as acne vulgaris, chloasma, and other pigmentation disorders among women of reproductive age (Azziz, 2003). The female predominance was highest for chloasma, where 95.0% of all presenting cases were female (n = 703 out of 740). Chloasma is an acquired pigmentary disorder that is associated with female sex hormones (such as estrogen and progesterone, as well as exogenous hormone therapy) combined with chronic ultraviolet (UV) radiation exposure (Handel et al., 2014). The significant burden of chloasma in this clinic underlines the role of private aesthetic dermatology in urban Indonesia in managing conditions driven by cosmetic concern as it affects patient's quality of life (Coban, 2018).

Acne vulgaris was the most frequent diagnosis in the study population, accounting for 1,230 visits or 15.2% of the overall clinical caseload. The age-stratified peak of acne vulgaris occurred in the Adults group aged 25-59 years (n = 803; 65.2% of all acne cases), followed by Young Adults aged 20-24 years (n = 227; 18.4%). Only a minor proportion of acne visits were recorded among younger age brackets. This marked peak in post-adolescent and mature adults rather than the expected adolescent peak differs from classic patterns described in Western epidemiological studies (Tan & Bhate, 2015).

This observed divergence supports the growing phenomenon of adult-onset acne, particularly prevalent among adult females in dense, highly polluted Asian urban populations. Post-adolescent acne in this setting is exacerbated by a multifactorial combination of psychological stress, environmental air pollution, metabolic and dietary factors, and the use of potentially comedogenic cosmetics or skincare regimens (Bagatin et al., 2019; Capitanio et al., 2010). The strong female predominance among acne patients in this private clinic (85.3% female) further reinforces the combined cosmetic, environmental, and hormonal drivers motivating urban working-age adults to pursue professional dermatological intervention.

Atopic dermatitis (AD) constituted the second most prevalent condition overall (n = 756; 9.3%). Unexpectedly, adults aged 25-59 years represented the largest single cohort of all AD patients (n = 264; 34.9% of all AD visits). On initial inspection, this high prevalence in adults appears unusual relative to established pediatric dermatological literature, which traditionally characterizes AD as an inflammatory dermatosis primarily affecting infants and early childhood, with high rates of spontaneous resolution or attenuation prior to adulthood (Nutten, 2015).

This unexpected trend can be attributed to the broad 35-year age span encompassing the World Health Organization (WHO) adult category, which spans from 25 years to 59 years of age. In contrast, young children are defined by a much narrower 4-year age range. This diagnostic distribution aligns closely with an epidemiological study in China, which similarly documented that adults aged ≥ 18 years accounted for 59.6% of total AD caseload when evaluated across broader range categories (Wang et al., 2017).

Furthermore, these findings are strengthened by global epidemiological evidence demonstrating that AD exhibits a bimodal prevalence distribution, characterized by an initial peak during early childhood followed by a significant secondary resurgence in the adult population (Puerta Durango & Chiesa Fuxench, 2024). This observed bimodal pattern underscores that adult-onset or persisting AD represents a major, globally recognized clinical entity that requires targeted long-term subspecialist management within urban private dermatology practices.

When analyzed by age concentration per demographic range, Young Children (1-4 years) accounted for the second-highest burden of AD (n = 121; 16.0%), with Infants (<1 year) contributing an additional 54 cases (7.1%) and Older Children (5-9 years) accounting for 106 cases (14.0%). Cumulatively pediatric patients (<10 years) accounted for 37.2% of all AD consultations. Additionally, the persistence of AD into adolescence and young adulthood in a subset of patients (152 adolescent cases; 37 young adult cases) reflects the documented chronic, relapsing-remitting course of intrinsic adult AD that necessitates long-term specialist management (Silverberg & Hanifin, 2013).

Chloasma, commonly referred to as melasma was the third most common diagnosis (n = 740; 9.1% of overall visits) and was overwhelmingly concentrated in the adult population (n = 644; 87% of all chloasma cases), with virtually zero cases recorded in infants or young children and only a few cases among adolescents (n = 15). Its extreme female predominance (95%) reflects the well-documented relationship between chloasma and female sex hormones, whether endogenous or exogenous (oral contraceptives, hormone replacement therapy) (Tamega et al., 2013).

Contact dermatitis was the fourth most prevalent diagnosis. Contact dermatitis which includes both Allergic Contact Dermatitis (n = 382; 4.7%) and Irritant Contact Dermatitis (n = 287; 3.5%) peaked in the working-age adult group (accounting for 65.2% and 69.7% of their respective diagnostic totals), consistent with occupational hazard exposures, frequent wet-work, household chemical use, and the extensive application of topical personal care products and cosmetics prevalent among urban working adults (Diepgen et al., 2016).

Interestingly, psoriasis was included in the top five diagnoses (n = 341; 4.2% of total visits). This relatively high volume of psoriasis in a private health and beauty clinic setting is directly attributable to the presence of an allergy and immunology consultant at the clinic, who frequently receives referrals from surrounding primary care practitioners and general outpatient facilities.

Vitiligo showed a relatively broad age distribution spanning multiple life stages (n = 306; 3.8% of total visits). Notably, the Young Adolescent group (10-14 years) contributed the largest share of vitiligo consultations (n = 107; 35.0%), closely followed by the Adult group (n = 102; 33.3%). This finding is consistent with literature indicating that clinical onset commonly occurs before age 20, which drives early medical consultation due to the severe cosmetic and psychosocial distress associated with depigmentation in young patients (Alikhan et al., 2011).

In contrast, degenerative and benign epithelial neoplasms, exemplified by seborrhoeic keratosis (n = 165; 2.0% of total visits), exhibited an age profile shifted toward mature age groups. It peaked heavily in the Adult group (n = 139; 84.2%), and dropped off in the Elderly group (≥ 60 years; n = 13) due to lower overall attendance among geriatric populations in private aesthetic settings. This is consistent with a study conducted in Bandung from 2015 to 2019, which reported that seborrhoeic keratosis occurs predominantly in middle-aged group (40-59 years) (Sutedja et al., 2022).

The global chi-square analysis of the 10×8 diagnosis–age matrix (χ^2 = 19,211.766, df = 63, $p < 0.001$) provided statistical evidence that diagnosis type and age group are not independent. This is clinically intuitive but important to confirm analytically: different conditions have fundamentally different age profiles, and any resource allocation, screening, or preventive program must be age-targeted to be effective (Smidt et al., 2010).

This study posseses notable methodological strengths, including a large, well-characterized sample size (n = 8,105), a complete two-year observation window capturing seasonal stability, standardized diagnostic coding using the ICD-10 framework, and strong analytical hypothesis testing across detailed age strata.

Several limitations should be acknowledged. First, the study uses visit-level data rather than patient-level data; patients with chronic conditions such as atopic dermatitis, psoriasis, and vitiligo require recurrent follow-up visits, individual patients with chronic diseases may have generated multiple visit records over two years, potentially inflating the relative prevalence of chronic dermatoses compared to acute self-limiting conditions. Second, the dataset was derived from a single private health and beauty clinic situated in a highly urbanized district of Central Jakarta (Menteng). Therefore, the patient demographic represents a specific middle-to-upper socioeconomic strata and may not fully generalize to the epidemiological profiles observed in public tertiary hospitals, community health centers, or rural populations across Indonesia. Third, the cross-sectional design limits the analysis to descriptive and associative inferences, precluding causal conclusions regarding risk factors. Fourth, data on disease severity (e.g., PASI, SCORAD, and VASI scores), disease duration, systemic comorbidities, treatment responsiveness, and detailed social determinants were not available in the electronic medical record database for analysis.

Future research should utilize prospective, longitudinal patient-cohort designs to track patient's individual course over time. Furthermore, multi-center comparative studies integrating data

across both public tertiary hospitals and private urban aesthetic practices are warranted to provide a comprehensive, nationally representative mapping of the evolving dermatological burden in Indonesia.

6. Conclusions

The distribution of dermatological diagnoses at a private health and beauty clinic in Menteng, Central Jakarta, is strongly patterned by age group and sex. Acne vulgaris, atopic dermatitis, chloasma, allergic contact dermatitis, and psoriasis vulgaris represent the largest share of the outpatient caseload. Statistical analysis confirms that all top-10 diagnoses have non-uniform age distributions (all $p < 0.001$), and that diagnosis type is significantly associated with age group (global $x^2 = 19{,}211.7$, $p < 0.001$). Female patients constitute nearly three-quarters of all clinical encounters.

These findings provide an evidence base for age- and sex-specific resource allocation, staffing, treatment protocol development, and preventive dermatology initiatives in urban private practice. Future longitudinal studies should examine trends over time, the impact of therapeutic interventions, and the relationship between diagnostic patterns and social determinants of dermatological health in Jakarta.

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